TRICARE Data Quality Training Course

June 2006

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TRICARE Management Activity (TMA)
Executive Information and Decision Support (EIDS)
United States Department of Defense Military Health System

Who We Are

- MHS centralized data store
- Receive, analyze, process, and store   100+ terabytes of data
- Thousands of users worldwide

Our Mission

- EIDS supports MHS decision-makers by collecting, processing, and managing enterprise data.

Our Vision

- EIDS is the recognized and preferred source of decision-critical data for the MHS.

Transform Data Into Information

Collect

Process

Analyze

Store

Military Health System Data Repository

4

EIDS Users

- **TMA/Health Affairs Staff**

  - Beneficiary Services Representatives & Health Benefits Analysts

- **Military Treatment Facility Executive Staff**

  - Through Offices of the Surgeons General

- **TRICARE Regional Offices**

- **Department of Justice, DoD Criminal Investigative Services**
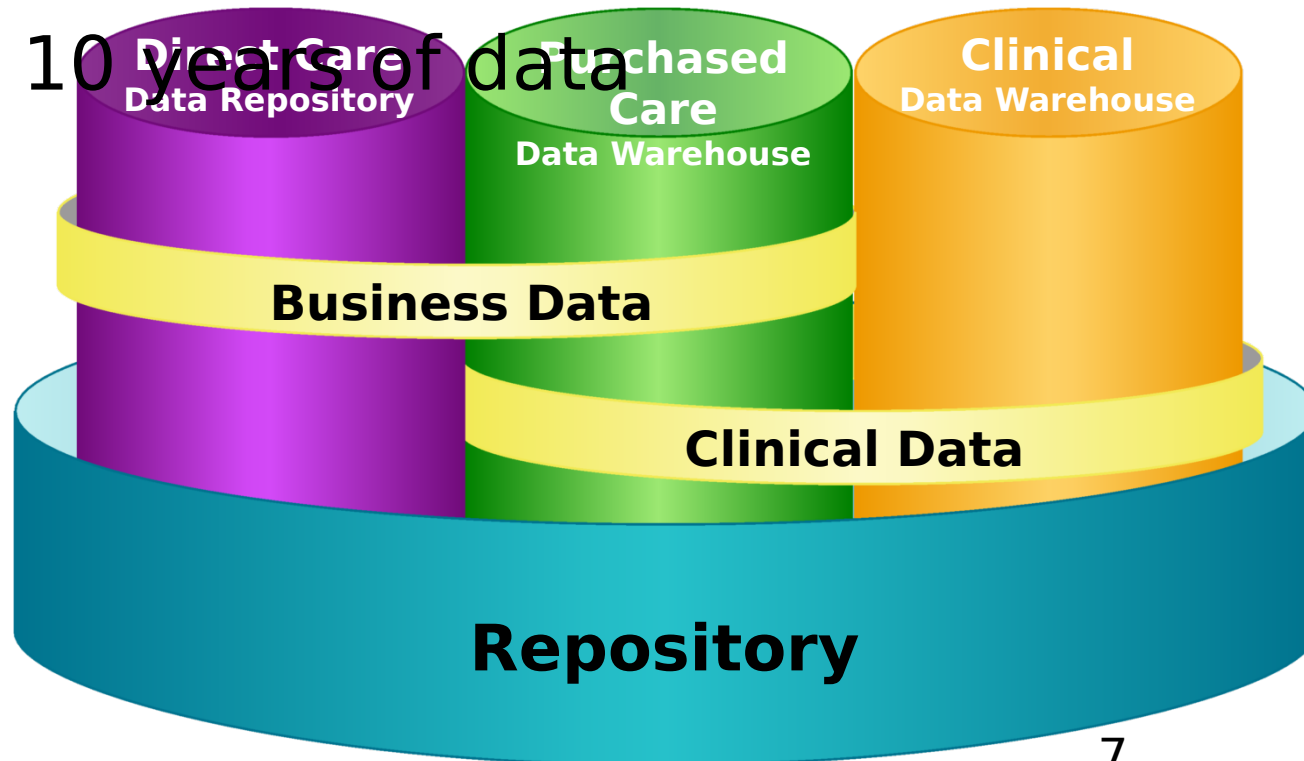
  - Fraud, Waste, and Abuse

MDR & Data Management
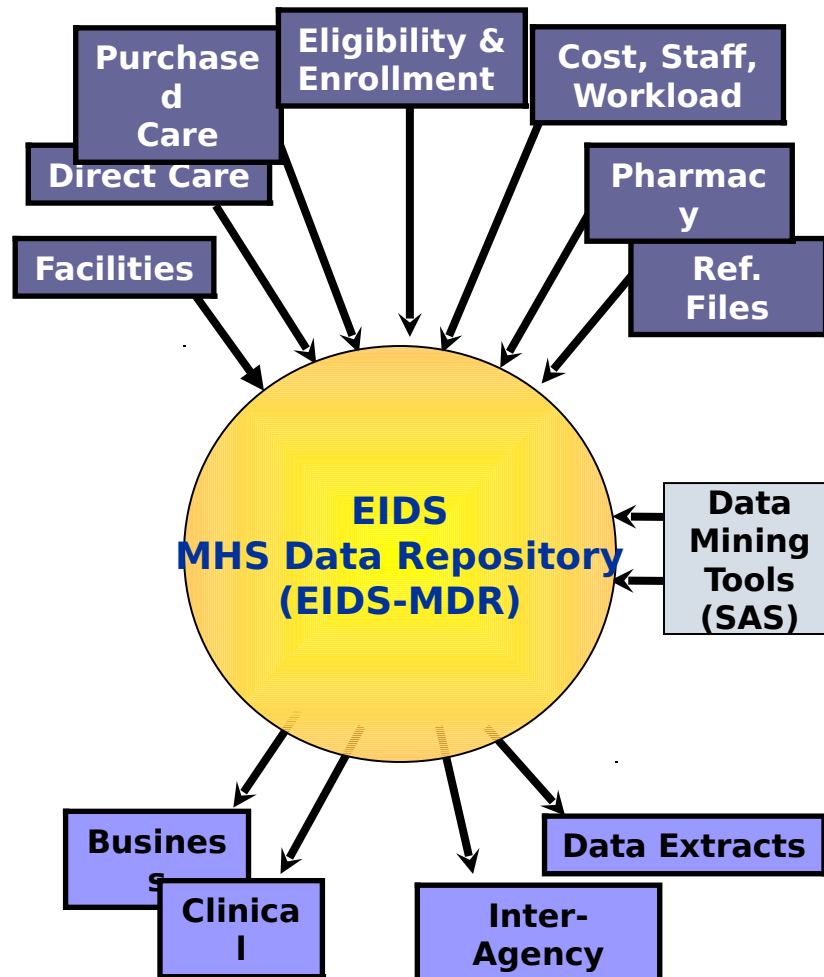
Central repository:

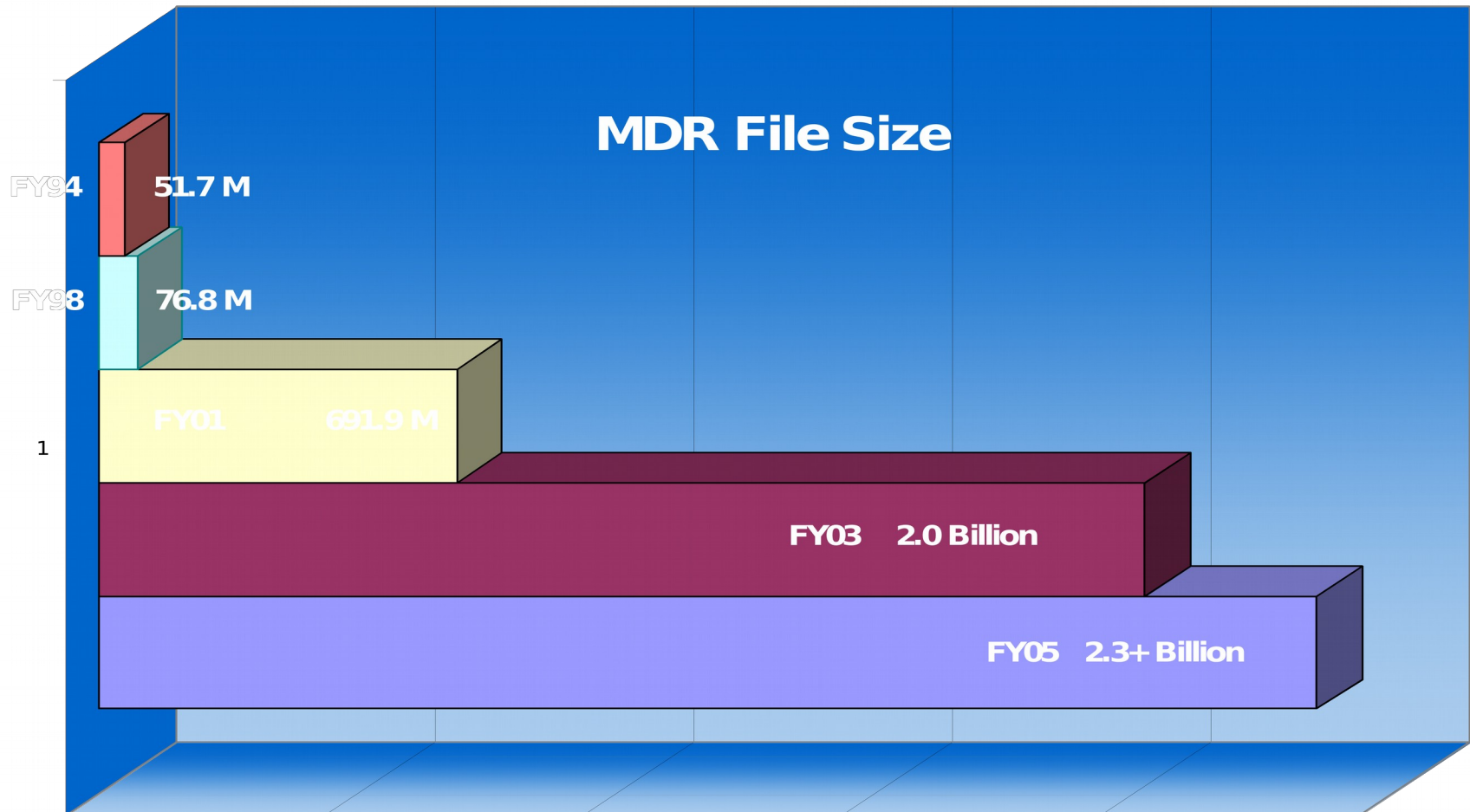- **MDR migrated to MHS enterprise architecture for decision support**
- **EIDS applying same proven approach to Purchased Care data**

How Much Data?

- More than 1.6 billion records on-line
  - 33 billion records archived
  - 10 years of data

Direct Care
Data Repository

Purchased Care
Data Warehouse

Clinical
Data Warehouse

Business Data

Clinical Data

Repository

Collect/Process

MDR File Size

FY94	51.7 M
FY98	76.8 M
FY01	691.9 M
FY03	2.0 Billion
FY05	2.3+ Billion

Frequency and Volume of Inbound Data

Data Type	Data Source	Inbound Periodicity	Records/Year (~M)
Population (Eligibility/Enrollment)	DMDC/DEERS	Monthly	160
Health Care Service Record (HCSR) Professional Claims	EIDS-SDCS TMA-Aurora	Daily	102
TRICARE Encounter Data (TED)	EIDS	Daily	177
Pharmacy Data Transaction Service (PDTS)	WebMD	Daily & Weekly	94
Standard Ambulatory Data Record (SADR)	CHCS & ADS Hosts	Daily	30
Standard Inpatient Data Record (SIDR)	CHCS Hosts	Monthly/Bi-weekly	0.32

Distribute

- Minimum 98 million records annually

1,666,860,447
November

1,722,509,744
December

M2 Records FY05

1,773,814,270
January
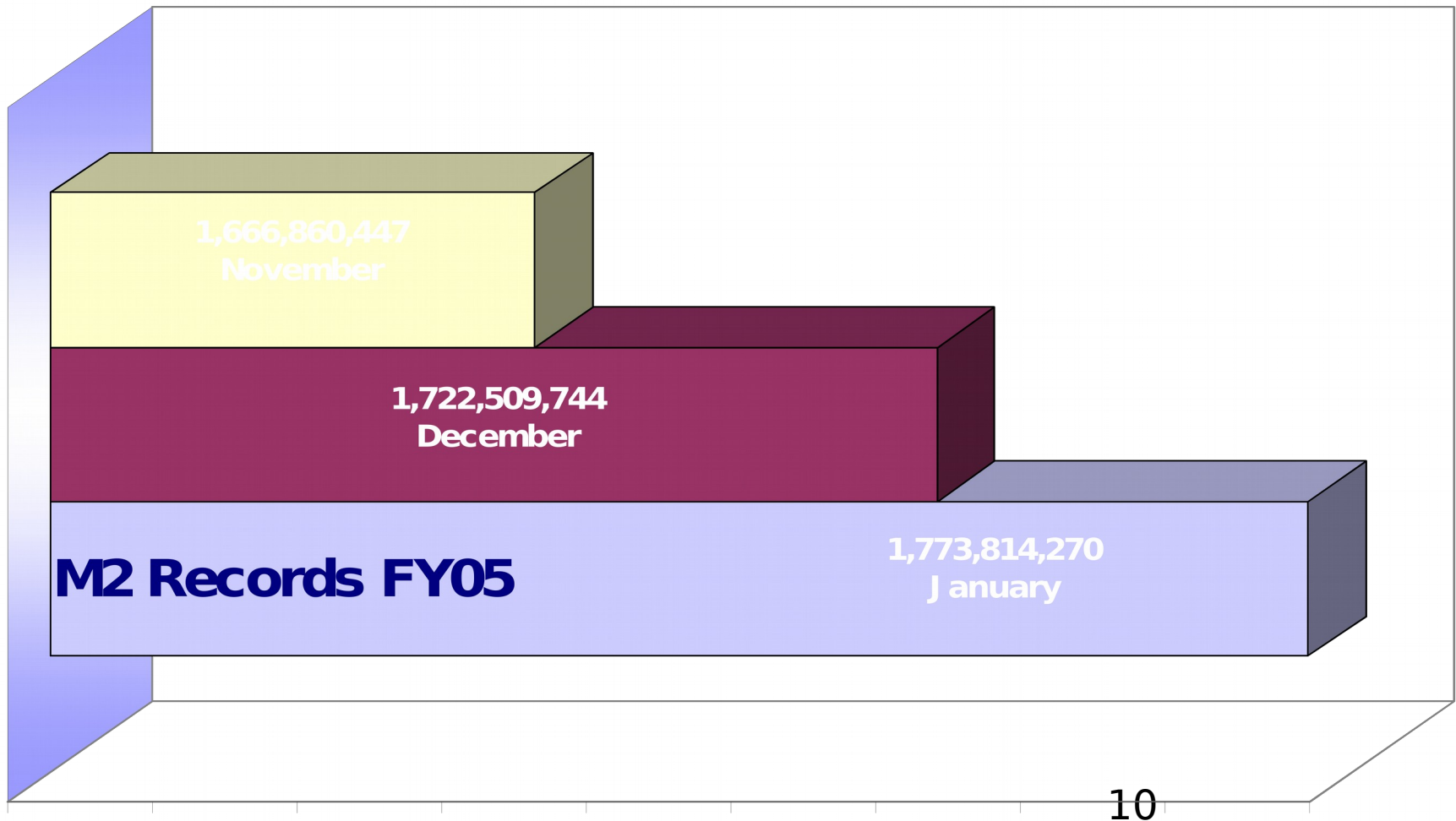
Distribute

Customer	Data Types	Outbound Frequency
Army, Navy, and Air Force Leadership	SIDR, SADR, Bundled M2 data	Monthly
Defense Medical Surveillance System (DMSS)	HCSR, SIDR, SADR	Monthly (Daily SADRs)
Global Emerging Infection Surveillance (GEIS)	Processed SADR & PDTS data (PHI stripped)	Daily
Deployment Health	SADR Data for Japan and Korea DMIS IDs	Daily
Centers for Disease Control & Prevention (CDC)	Processed SADR data (PHI stripped)	Daily
Naval Environmental Health Center (NEHC)	Processed HL7 data (PHI stripped)	Weekly
Federal Health Information Exchange (FHIE) DVA	Processed HL7 & Separatee SADR & PDTS data	Monthly
WebMD (PDTS & TMOP TED retail)	TED Error Reports & TED reject records (plus tests)	Daily
TRICARE Commercial Partners	TED Error Reports & TED reject records	Daily
Internal Data Marts	Full Data Sets	Daily, Weekly, Monthly

Applications and Components Distribution

Business Marts

Direct Care:

- M2
- MCFAS
- GIS
- Prospective Payment

Purchased Care:

- PCDIS
- PCMIS
- PCURES
- *CRDM (15 sub-sys)*
- HA/TA
- DCS

Clinical Marts

- **Clinical Data Mart (IOC)**
- **DMSS (Legacy)**
- *Medical Surveillance*
- *Clinical Analysis and Reporting (FOC)*
- *Provider Profiling*

Enterprise Management:

- **MDR**
  - Purchased Care Data Warehouse
  - Business Data Repository
  - *Clinical Data Warehouse*
- **TED Processing**
  - TED ODS
  - HCSR ODS
  - Feed Node
  - Extraction Transformation Layer
- **SDCS (Legacy)**
  - TED Phase II
  - PEPR 6A
- EIDS Portal
- PEPR Portal
- FHIE/BHIE

How We Manage Data

- Security
- Quality Assurance
- Validity Tests

Management Control Measures

- Product Release (to include data)

  - Multiple gates to assure acceptance by functional proponent

  - Design reviews (URS, PDR & CDR)

  - Testing & data validity checks

  - Each gate requires approval by functional proponent

Security Measures

- Information Assurance & Vulnerability Assessment (IAVA) compliant

- TMA Privacy Office oversight

- HIPAA data anonymized based on user need (e.g. role-based access)

- All records encrypted during distribution

- All data marts certified before users are permitted access

EIDS Products

SOURCES **REPOSITORY** **DATA MARTS**

AHLTA

MEQS

DEERS

MCSCs

Clinical

Cost

Eligibility

Purchased Care

MHS Data Repository (MDR)

Ad hoc Reports

Clinical

Projections

Claims

M2

CDM

MCFAS

PEPR

16
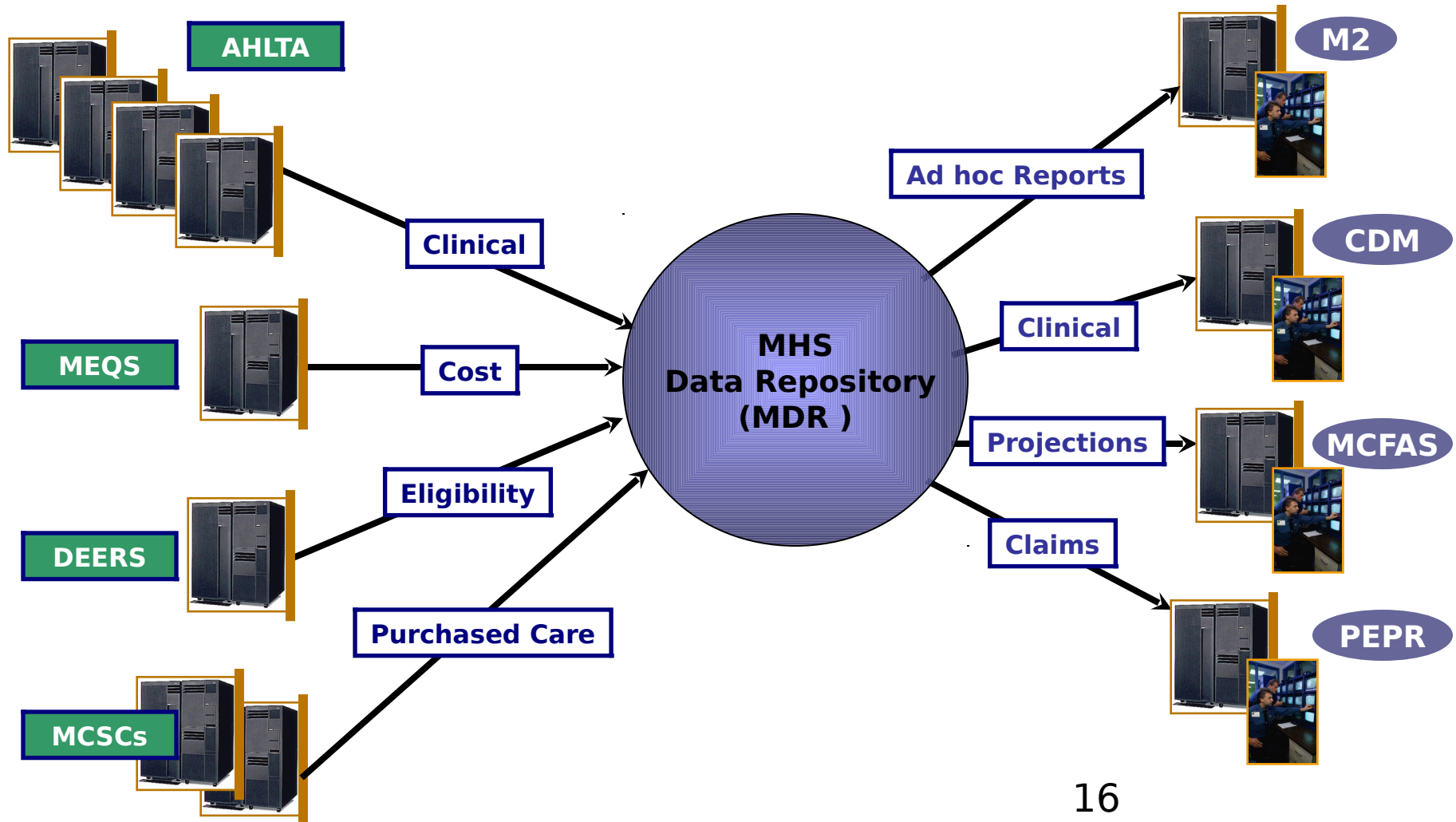
MDR (MHS Data Repository)

- One-time data capture and validation of MHS data world-wide
- More than 5 billion records on-line consisting of 10+ years of data
- Typical users: small cadre of high-level data analysts

EIDS Data Repository (MDR)

17
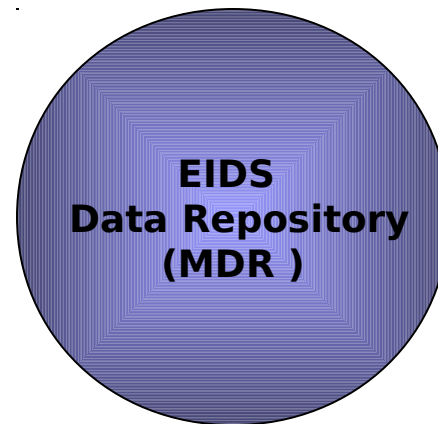
M2 (MHS Management Analysis & Reporting Tool)

- Complex, powerful ad hoc query tool for detailed trend analysis such as patient and provider profiling
- Typical users: high-level data analysts skilled in Business Objects software
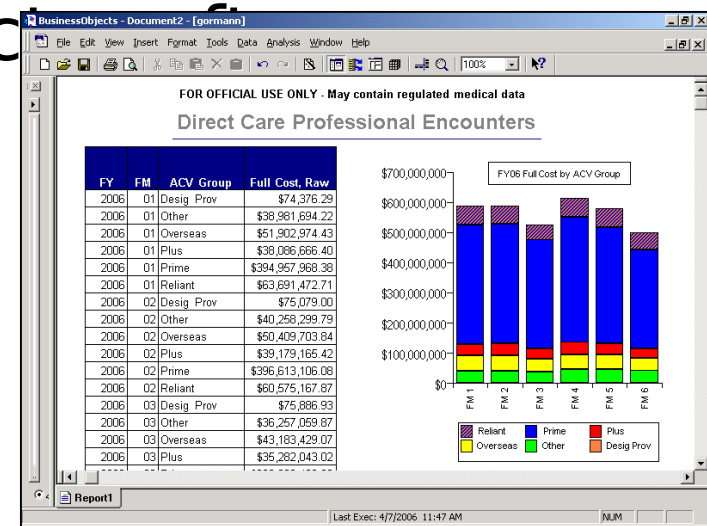
PEPR (Patient Encounter Processing & Reporting)

- Examines TRICARE purchased care claims data through Web-based suite of applications

- Typical users: MHS managed care analysts, healthcare planners, and financial analysts

MCFAS

(Managed Care Forecasting & Analysis System)

- Forecasts MHS beneficiary populations from worldwide down to individual zip codes

- Typical users: MHS managed care analysts, healthcare planners, resource managers, and financial analysts
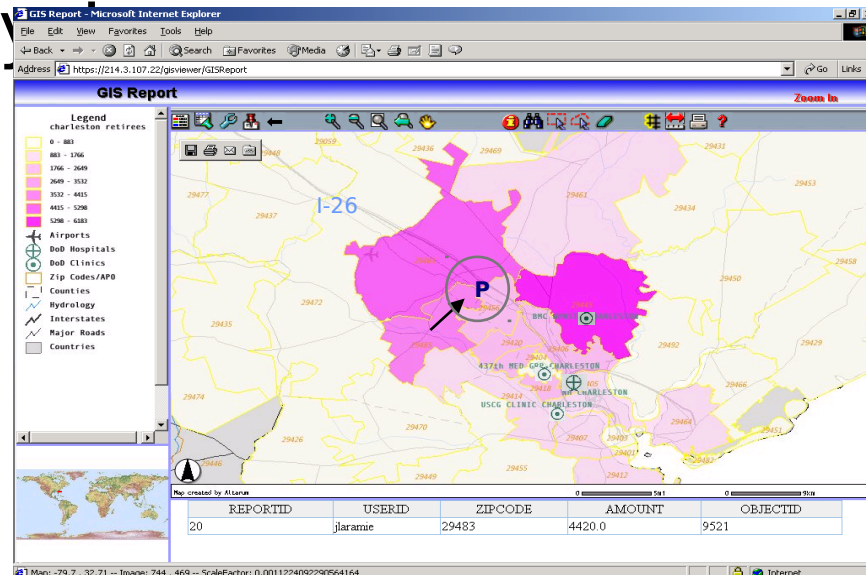
Data Quality Examples
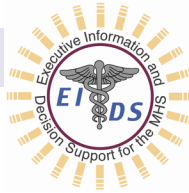
Operations Data Quality Tools

Background (excerpt from FY 99 MDR Document)

- DQ Procedures - Develop and document procedures that implement
  - **Procedures for capturing and cataloguing data files**
- DQ Assessment - Assess the methods to
  - **Monitor data completeness**
- DQ Feed Assessment
  - **Perform Data Feed Quality Assessment…**
- Development of procedures and metrics that
  - **Assess the Data Quality (DQ) of data files received at the Feed Nodes**…
  - **Propose methods for DQ checks**
  - **Develop software to perform DQ checks.**
- DQ Software Development
  - **Develop software that implements the MDR DQ assessments to respective data feeds…**
- DQ Software Implementation
  - **DQ software procedures…..to provide metrics and a management perspective of the DQ in files**

"A thousand miles can lead so many ways…Just to know who is driving what a help it would be"
The Moody Blues

Operations Data Quality Tools
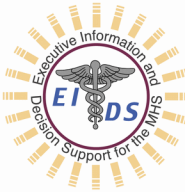
- A "Real Time" DB2 database of key data quality and data completeness elements for:
  - SIDR SADR HL7 PDTS GCPR Appointment Ancillary
- Resides on node 11
- **Database is updated** *DAILY* (DB, in combination with scripting provides "event driven" alerting features)
- **MDR/M2 processing rules applied where appropriate (same as MDR)**
- "Real Time" & "Snapshot" views of key data completeness measures for all DMIS IDs
- Web access and front end for reporting (standard reports)
- Script based alerting (e-mail for critical DQ areas)
- Multi layer data comparisons from Raw to Processed data (procedure-based actions)
- Statistical Process Control (SPC) algorithms & Control Charts to detect data anomalies

23
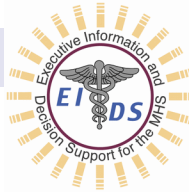
Operations Data Quality Tools

THE DATATRAKER IS A "MINI MDR/M2" WHERE EVERYTHING IS PROCESSED IN REAL TIME

- "Data Tracker" tools and reports

  SIDR and SADR, HL7, **Appointment, Ancillary**, TED Inst/Non-Inst the primary reports provide:
    - File based accounting (e.g. Gap reports)
    - Treatment based accounting (e.g. reports based on care date)
    - Timeliness reporting (e.g. lag from care rendered date to ingest)
    - Other statistical reports including benchmarking against WWR
    - To be fielded: Statistical Process Control Alerting for SADR anomalies

- Other "Data Tracker" tools and reports
    - Monthly "Hutchinson-like" report (SIDR and SADR vs WWR Benchmarking)
    - Ad Hoc Queries to the "Data Tracker"
    - GCPR & PDTS Gap Reports – Receipt Reports – "Pull Reports"

- Current reports on the EIDS web site created by the "Data Tracker" for end users.
    - Daily SADR by HOST DMIS (The **"What Was Received Yesterday"** Report)
    - Daily SADR by Treatment ID – 90 Day (The daily **"90 Day Roller"** Report)
    - Monthly SIDR by Tx DMIS
    - Weekly HL7 Gaps

24
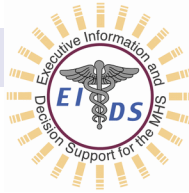
Operations Data Quality Tools

A PARTIAL List of Standard Reports Available from the EIDS Web Enabled "Data Tracker" Database

- **HL7 tracking**: Displays a tabular view of file submission history for each HL7 site.
- **SADR gaps**: Displays a list of sites, by ADS version, that did not report data for at least a fixed number of days
- **SADR lags**: Displays the mean and standard deviation of the reporting lag for each site, by ADS version.
- **SADR scores**: Displays a SADR transmission completeness report. For each site, by ADS version, a completion percentage is listed. assumed.
- **SADR tracking**: A tabular view of file and record submission history for each site, by ADS version. Each column corresponds to a file date.
- **SADR treatment DMIS ID gaps**: Displays a list of treatment DMIS IDs that did not report data for at least a fixed number of days.
- **SADR treatment DMIS ID scores**: A SADR transmission completeness report. For each treatment DMIS ID, a completion percentage is listed.
- **SADR treatment DMIS ID tracking**: Displays a tabular view of record submission history for each treatment DMIS ID.
- **SADR treatment DMIS ID (by visit type) tracking**: Displays a tabular view of record submission history for each treatment DMIS ID. The displayed counts indicate the number of unique SADR data records, determined by appointment prefix and appointment identifier number.
- **SIDR gaps**: A list of reporting sites that did not report data for a fixed number of SIDR months, up to and including the ending SIDR month
- **SIDR tracking**: Displays a tabular view of file and record submission history for each reporting site.
- **SIDR treatment DMIS ID tracking**: Displays a tabular view of SIDR completion history for each treatment DMIS ID.
- **GCPR gap**: Displays a list of sites that did not report data for at least a fixed number of days.

25

Operations Data Quality Tools (cont)

- **GCPR sites**: Displays a list of GCPR sites by Service, region, and DMIS ID, allowing the user to review the mapping of GCPR sites to DMIS IDs.
- **GCPR tracking**: Displays a tabular view of file submission history for each GCPR site. Each column corresponds to a date within the range specified.
- **HL7 gap**: Displays a list of sites that did not report data for at least a fixed number of days, as specified by the user query.
- **PDTS gap**: Displays a line if PDTS data has not been reported for at least a fixed number of days, as specified by the user query.
- **PDTS tracking**: Displays a tabular view of file submission history for PDTS. Each column corresponds to a file date within the range specified.
- **Ancillary Tracking**: Displays a tabular view of file and record submission history for each reporting DMIS ID. Each column corresponds to a file date within the selected range.
- **Ancillary Gap:** Displays a list of reporting DMIS IDs, that did not report data for at least a fixed number of days.
- **Ancillary treatment DMIS ID Tracking:** Displays a tabular view of record submission history for each ancillary performing DMIS ID. Each column corresponds to a service date within the range specified. The displayed counts indicate the number of unique ancillary data records, as determined by the accession number for laboratory, exam number for radiology, and prescription number for pharmacy.
- **Ancillary treatment DMIS ID Gap**: Displays a list of performing DMIS IDs that did not report data for at least a fixed number of days, as specified by days, up to and including the ending service date, as specified.
- **Appointment treatment DMIS ID Tracking**: Displays a tabular view of record submission history for each appointment treatment DMIS ID. Each column corresponds to an appointment date within the inclusive range specified by the beginning appointment date, bgndate, and the ending appointment date, enddate.   The displayed counts indicate the number of unique appointment data records, as determined by the appointment identifier number and the node seed name.
- **Appointment treatment DMIS ID Gap:** Displays a list of treatment DMIS IDs that did not report data for at least a fixed number of days, as specified by days, up to and including the ending appointment

Starting with Run Charts

- *Examples of facilities showing gaps in daily outpatient encounter data receipt. Investigation & data recovery actions were required.*
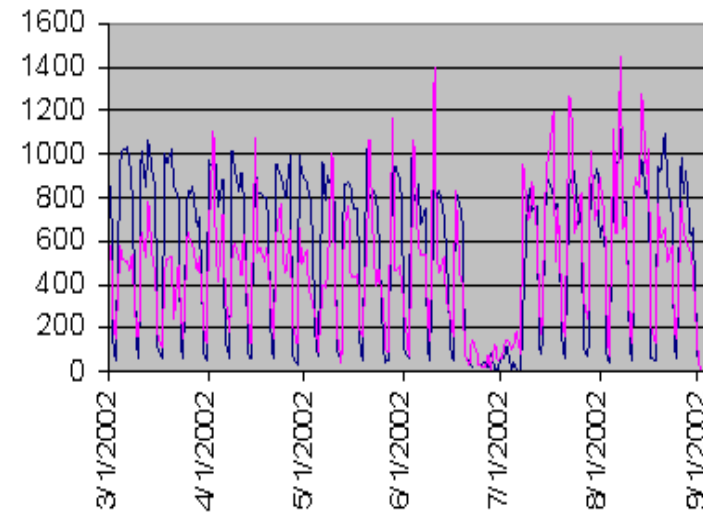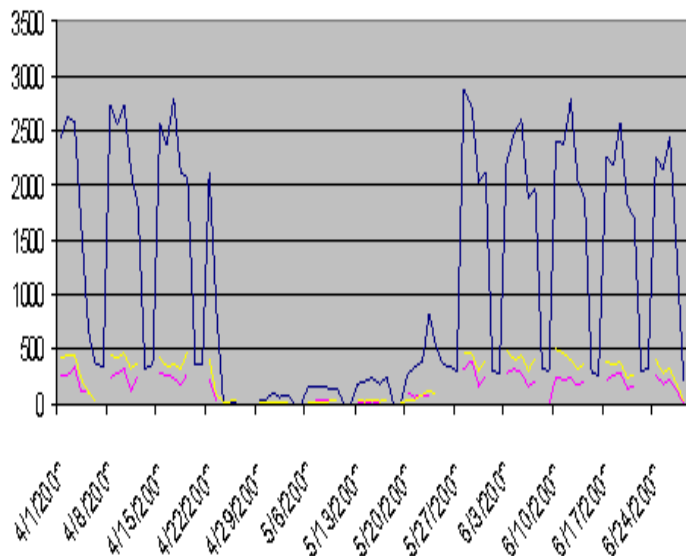
- *Data Set has no correlation with other source system provided data sets*

Data Completeness Determination

- **"Completeness" as a Process Control Problem**
  - Amenable to Statistical Process Control
  - Examine for Special Cause Variation
  - Signals when a problem has occurred
  - Detects variation
  - Allows "Process •Characterization"
  - Reduces need for inspection

ZONES.STG: Line Plot [PISTONS3.STA 7v*125c]

Default Definitions of Zones for Runs Tests

Zone A
Zone B
Zone C
Zone C
Zone B
Zone A

Samples

Tests For Control
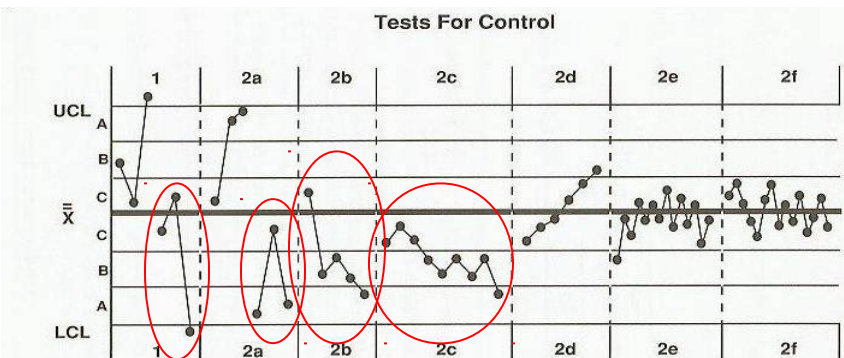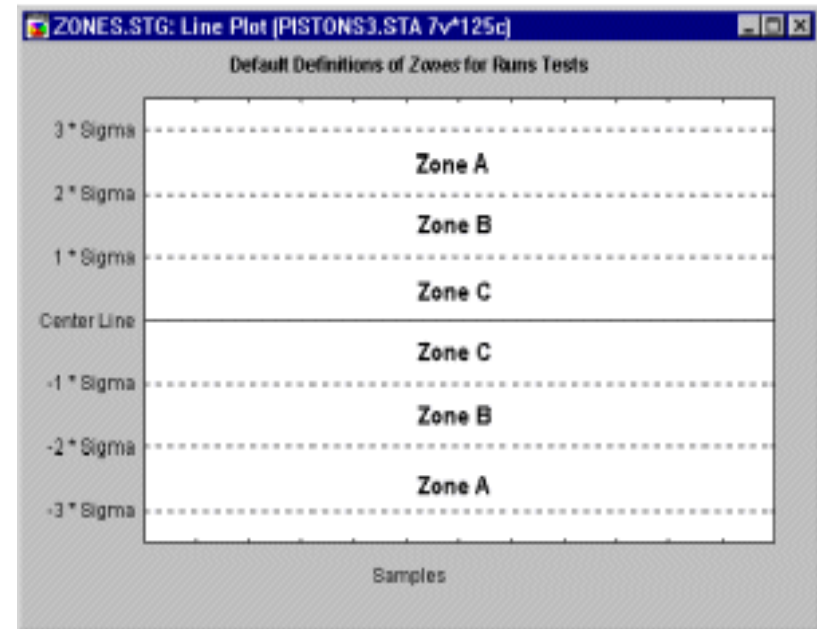
Compare Each Day To Itself

Red Boxes/X's/etc indicate "Alerts" sent to DQ Team via automated email

Essentially a projection of previous data forward in time to today, then a comparison of this projection with the newly arrived data.

Chart is "Encounters by day"
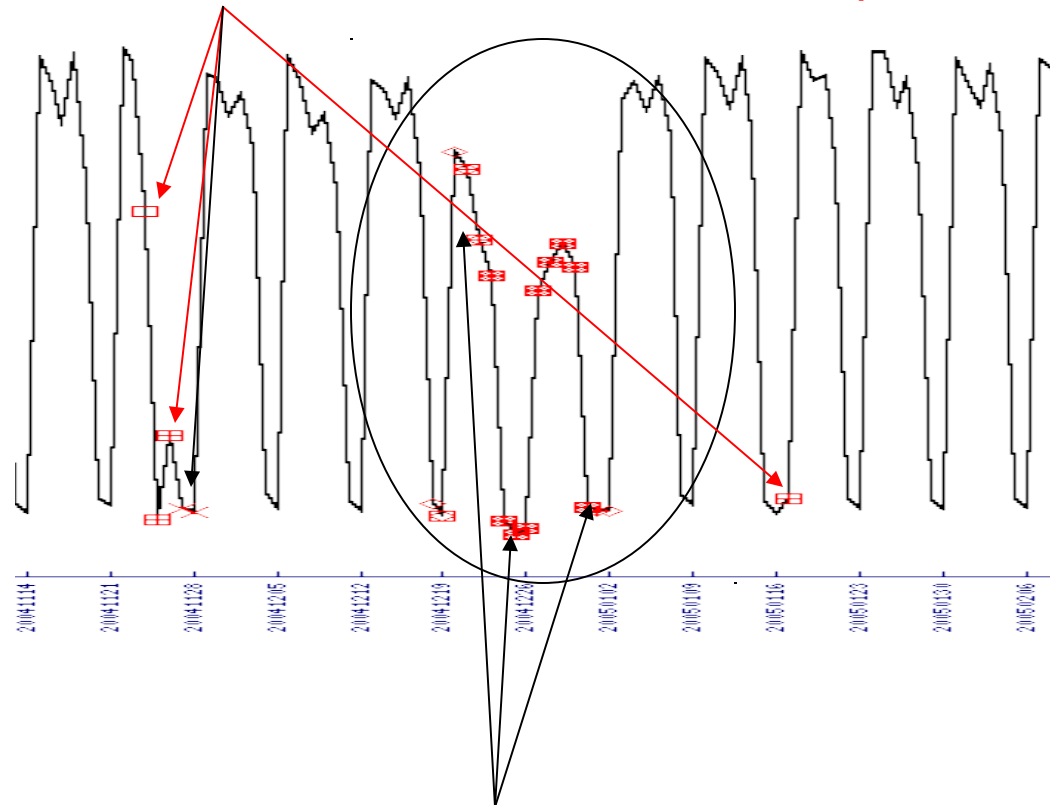
Holiday Logic Pending

29

Identifying Data Completeness Problems

- **An Alerting and Notification Issue**
  - How do you identify and present "possible" problems?
    - When the "problem" is transient
    - When it is one data point in a series
    - From one of a vast number of input data sources daily
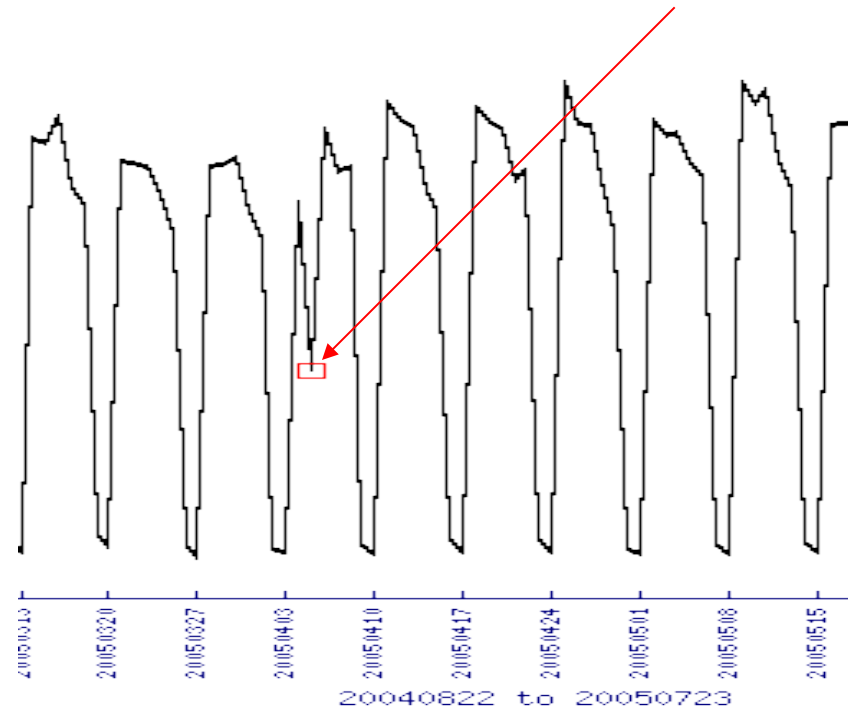
20040822 to 20050723

Essentially a projection of previous data forward in time to today, then a comparison of this projection with the newly arrived data.

30

Soon to be a Data Tracker Report Series including

- **SADR vs Appointment Tracking** (a "Real Time" Hutchinson Report, such as this example)
- **SADR vs Appointment Delta Alerting**

	B	C	F	G	K	AA	AQ	BG	BX	B
1					SADR-includes appt inferred	Post Processed Appointment Problem Indicator	SADR-does not include appt inferred	WWR		
2	DMISID	FACILITY	MONTH		A060109	H060109	S060109	W060112		
133	0015	9th MEDICAL GROUP BEALE AFB	Oct-04		3,722	3,624	3,720	3,715		
134	0015	9th MEDICAL GROUP BEALE AFB	Nov-04		3,664	3,586	3,663	3,659		
135	0015	9th MEDICAL GROUP BEALE AFB	Dec-04		3,579	3,495	3,574	3,575		
136	0015	9th MEDICAL GROUP BEALE AFB	Jan-05		4,007	3,902	4,006	3,994		
137	0015	9th MEDICAL GROUP BEALE AFB	Feb-05		3,785	3,686	3,782	3,773		
138	0015	9th MEDICAL GROUP BEALE AFB	Mar-05		4,886	4,743	4,883	4,846		
139	0015	9th MEDICAL GROUP BEALE AFB	Apr-05		4,136	689	4,136	4,123		
140	0015	9th MEDICAL GROUP BEALE AFB	May-05		4,000	3,926	4,000	3,986		
141	0015	9th MEDICAL GROUP BEALE AFB	Jun-05		4,539	4,446	4,539	4,525		
142	0015	9th MEDICAL GROUP BEALE AFB	Jul-05		3,600	2,685	3,598	3,310		
143	0015	9th MEDICAL GROUP BEALE AFB	Aug-05		4,681	4,216	4,672	4,292		
144	0015	9th MEDICAL GROUP BEALE AFB	Sep-05		4,173	3,551	4,163	3,571		
145	**015 Total**				48,772	42,549	48,736	47,369		
952	0101	20th MEDICAL GROUP SHAW AFB	Oct-04		7,815	6,368	6,050	6,369		
953	0101	20th MEDICAL GROUP SHAW AFB	Nov-04		7,182	5,740	5,278	5,748		
954	0101	20th MEDICAL GROUP SHAW AFB	Dec-04		6,808	5,780	5,416	5,792		
955	0101	20th MEDICAL GROUP SHAW AFB	Jan-05		7,523	6,495	5,863	6,488		
956	0101	20th MEDICAL GROUP SHAW AFB	Feb-05		7,371	5,853	5,050	5,860		
957	0101	20th MEDICAL GROUP SHAW AFB	Mar-05		8,905	7,347	6,279	7,354		
958	0101	20th MEDICAL GROUP SHAW AFB	Apr-05		8,158	6,938	5,775	6,953		
959	0101	20th MEDICAL GROUP SHAW AFB	May-05		7,453	6,121	5,482	5,965		
960	0101	20th MEDICAL GROUP SHAW AFB	Jun-05		7,767	6,249	5,786	6,231		
961	0101	20th MEDICAL GROUP SHAW AFB	Jul-05		6,319	3,415	4,590	3,405		
962	0101	20th MEDICAL GROUP SHAW AFB	Aug-05		8,801	6,085	8,440	6,073		
963	0101	20th MEDICAL GROUP SHAW AFB	Sep-05		7,850	2	7,850	5,687		
964	**101 Total**				91,952	66,393	71,859	71,925		

31

File   Edit   View   Insert   Format   Tools   Chart   Window   Help

Type a question for help

Arial   10   B I U

Chart 1

	Treatment	Medical Tr	12/27/2005	12/28/2005	12/29/2005	12/30/2005	12/31/2005	1/1/2006	1/2/2006	1/3/2006	1/4/2006	1/5/2006	1/6/2006	1/7
24	46	45th MEDI	2212	2239	1831	336		1		3208	2716	2615	2254	
25	49	WINN ACH	2176	1767	1753	1191	310	280	453	2891	3258	2503	2898	
26	66	89th MEDI	2158	1898	1636	287	519	352	543	3120	2431	2720	2167	
27	24	NH CAMP							929	2657	2372	2975	2738	
28	78	55th MEDI							769	2151	2276	2235	1884	
29	55	375th MED							828	2858	2617	2566	2581	
30	120	1st MEDIC							400	2335	2794	3012	1906	
31	33	10TH MED							530	2040	1874	2106	1943	
32	48	MARTIN A							774	2786	2985	2850	2743	
33	10	355th MED							1	2427	1855	1765	1631	
34	32	EVANS AC							563	2238	2501	2531	2244	
35	123	DEWITT A							825	2351	2121	2004	2027	
36	378	NBHC LIT							872	2027	1864	1840	1728	
37	61	IRELAND ,							1151	2332	2414	2114	1910	
38	607	LANDSTU							323	2499	2662	1519	2295	
39	4	42ND MED							623	2125	1983	1697	1782	
40	6	3rd MEDIC							765	2032	1929	1849	1733	
41	121	MCDONAL							592	1518	1545	1532	1624	
42	96	72nd MED							635	1876	1956	1832	1567	
43	73	81st MEDI							809	1539	1463	1645	1357	
44	126	NH BREM							441	1494	1430	1388	1609	
45	75	L. WOOD	1346	1194	1335	598	271	426	582	1667	1705	1825	1781	
46	98	REYNOLD	1332	1320	1337	226	98	110	270	1923	1934	2024	1749	
47	330	GUTHRIE .	1328	1226	1368	877	419	512	308	2024	2046	2331	2675	
48	51	78th MEDI	1322	1079	1226	930		177	262	1788	1726	1597	1680	
49	105	MONCRIE	1310	1588	1286	880	267	241	491	2113	2195	2105	2470	
50	57	IRWIN ACI	1258	1088	1136	1005	496	268	284	1645	1461	1422	1503	
51	621	NH OKINA	1166	1175	927	161	125	268	239	1055	1606	1201	1018	
52	3	LYSTER A	1143	1040	1071	545	204	182	343	1662	1349	1512	1545	
53	92	NH CHER											1422	
54	119	75th MED											1052	
55	69	KIMBROU											1154	

Chart: 45th MEDICAL GROUP (line chart, values 0–4000 plotted against dates 12/27/2005, 1/10/2006, 1/24/2006, 2/7/2006, 2/21/2006, 3/7/2006, 3/21/2006). Legend: 45th MEDICAL GROUP.

- **Daily Ancillary Data Report - 90 Day Roller**

appt1

Chart Area

EI/DS Tracking Reports

Select Report:

PDTS Gap

- SADR Sites
- SADR Size Discriminator
- SADR Summary
- SADR Tracking
- SADR Tx DMIS ID Gap
- SADR Tx DMIS ID Score
- **SADR Tx DMIS ID Tracking**
- SADR Visit Discriminator

SIDR
- SIDR Gap
- SIDR Army Gap
- SIDR Tracking
- SIDR Tx DMIS ID Gap
- SIDR Tx Summary
- SIDR Tx DMIS ID Tracking

HL7
- HL7 Duplicate Submissions
- HL7 Gap
- HL7 Retransmission
- HL7 Sites
- HL7 Tracking

PDTS
- PDTS Gap
- PDTS Rx Gap
- PDTS Rx Tracking
- PDTS Tracking

GCPR
- GCPR Gap
- GCPR Sites
- GCPR Tracking

WBAM0108	09/30/2002	09/30/2002 - 04:34:35	56		0108	WILLIAM BEAUMONT AMC
WOOD0075	09/29/2002	09/30/2002 - 01:47:21	21		0075	L. WOOD ACH
WOOD1511	09/29/2002	09/30/2002 - 01:47:39	163		1511	RICHARD G. WILSON CTMC
WOOD1519	09/29/2002	09/30/2002 - 01:47:53	1		1519	USA OCCUP HLTH CLIN-GOODFELLOW

Files received with errors

/sourcedata/ads/sadr/ADGEIDSSA093002.BETH6201.d020930t015312 KGADS v2.3 NED		
Content errors	2	Total Records Failed
	2	Non-printing characters in data
/sourcedata/ads/sadr/ADGEIDSSA100102.LAND0606.d020930t184731 KGADS v2.3 NED		
Content errors	2	Total Records Failed
	2	Non-printing characters in data
/sourcedata/ads/sadr/ADGEIDSSA100102.LAND0805.d020930t184849 KGADS v2.3 NED		
Content errors	1	Total Records Failed
	1	Non-printing characters in data
/sourcedata/ads/sadr/ADGEIDSSA093002.FOXA0001.d020930t014717 KGADS v2.3 NED		
Content errors	9	Total Records Failed
	9	Non-printing characters in data
/sourcedata/ads/sadr/ADGEIDSSA093002.LEAV7297.d020930t224722 KGADS v2.3 NED		
Content errors	2	Total Records Failed
	2	Non-printing characters in data
/sourcedata/ads/sadr/ADGEIDSSA100102.KELL0086.d020930t230420 KGADS v2.3 NED		
Missing footer	1	Total Records Failed
	1	Non-printing characters in data

Number of consecutive days since last SADR file received

Site ID	ADS Type	Medical Treatment Facility	Days Missing	Host
CAFB0085	KGADS v2.3 NED	27th MEDICAL GROUP	14	edwn35_sw
KELL0311	KGADS v2.3 NED	NATICK AHC	44	edwn35_sw
KELL8015	KGADS v2.3 NED	KELLER ACH TSC-PCM	73	edwn35_sw
LAND1449	KGADS v2.3 NED	249th COMBAT SUPPORT HOSPITAL (TOE)	26	edwn37_sw
LEAV1833	KGADS v2.3 NED	USADC SMITH	47	edwn35_sw
LEAV1835	KGADS v2.3 NED	USADC-DISCIPLINY BKS #3 FT LEAVENWORTH	47	edwn35_sw
LUKE0009	KGADS v2.3 NED	56th MEDICAL GROUP	7	edwn35_sw
MAFB1748	KGADS v2.3 NED	341 DS/SGD	42	edwn35_sw
POLK1620	KGADS v2.3 NED	TMC-2-FT. POLK	80	edwn37_sw
POLK1621	KGADS v2.3 NED	TMC-3-FT. POLK	80	edwn37_sw
POLK1622	KGADS v2.3 NED	TMC-4-FT. POLK	80	edwn37_sw
RAFB0051	v2.1 NED	78th MEDICAL GROUP	4	edwn35_sw
RUCK0003	v2.1 NED	LYSTER ACH	27	edwn37_sw
TRIP0287	KGADS v2.3 NED	15th MEDICAL GROUP	5	edwn35_sw

Web site with Pull Down listing of "Standard Data Quality and Data Completeness Reports

US Army Sites

Site ID	Medical Treatment Facility	5/31/2002	6/1/2002	6/2/2002	6/3/2002	6/4/2002	6/5/2002	6/6/2002	6/7/2002	6/8/2002	6/9/2002	6/10/200	6/11/200	6/12/200	6/13/200	6/14/200	6/15/200	6/16/200	6/17/200	6/18/200	6/19/200	6/20/200	6/21/200	6/22/200	6/23/200	6/24/200
0001	FOX ARMY HEALTH CENTER	7	5	4	8	9	8	8	8	4	4	8	8	8	9	9	5	4	7	7	8	7	7	4	4	9
0002	NOBLE AHC	12	12	12	12	12	12	12	11	12	12	12	12	11	12	12	12	12	13	12	12	12	12	12	12	13
0003	LYSTER ACH	12	9	10	10	9	11	11	11	10	9	10	10	10	11	11	10	9	11	11	11	11	10	10	8	11
0005	BASSETT ACH	13	12	11	12	11	12	12	12	12	12	12	12	12	12	11	12	12	12	11	12	12	12	12	11	12
0008	R W BLISS ARMY HEALTH CENTER	8	5	6	9	8	9	10	9	5	6	8	8	9	10	9	6	4	8	9	10	9	8	3	5	8
0032	EVANS ACH	12	12	12	13	12	13	13	12	12	12	13	13	13	12	13	13	12	13	12	13	12	13	13	12	13
0037	WALTER REED ARMY MEDICAL CENTER	8	6	4	8	8	7	7	8	5	5	9	8	8	7	7	5	5	8	8	6	7	8	5	5	8
0047	EISENHOWER AMC	13	12	12	12	13	12	13	13	13	12	13	13	13	16	12	12	12	12	13	13	13	13	14	12	12
0048	MARTIN ACH	13	12	12	12	13	13	13	13	13	12	13	13	12	12	13	12	12	13	12	13	13	12	13	12	13
0049	WINN ACH																									
0052	TRIPLER AMC	13	13	14	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
0057	IRWIN ACH	11	12	12	12	12	12	11	12	11	12	11	12	12	12	12	12	11	12	11	12	12	11	11	12	11
0058	MUNSON ARMY HEALTH CENTER	10	9	8	10	9	9	10	9	7	8	10	10	10	12	10	6	7	10	10	9	10	10	7	9	11
0060	BLANCHFIELD ACH	12	12	13	13	13	13	13	12	13	12	13	13	13	13	13	13	13	13	12	12	13	13	13	13	13
0061	IRELAND ACH	11	12	12	12	12	12	12	12	12	12	12	12	13	13	13	12	12	12	12	12	12	12	12	12	12
0064	BAYNE-JONES ACH	11	12	12	12	12	12	13	12	12	12	12	13	12	12	12	12	12	12	12	12	12	12	12	12	12
0075	L. WOOD ACH	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
0086	KELLER ACH	11	11	11	11	11	11	12	11	10	10	12	12	12	11	10	9	10	10	11	10	9	12	10	8	10
0089	WOMACK AMC	13	13	13	13	13	13	13	13	13	13	13	13	13	13	9	13	13	13	13	13	13	13	13	13	13
0098	REYNOLDS ACH	12	13	12	13	13	12	12	12	12	12	12	13	12	12	12	12	12	12	12	12	12	11	12	13	
0108	WILLIAM BEAUMONT AMC	12	13	13	13	13	13	13	12	13	12	13	13	13	13	12	13	13	13	12	13	13	12	12	13	
0110	DARNALL ACH	13	13	13	13	13	13	13	13	10	12	13	13	13	13	13	13	13	13	13	12	13	13	13	13	
0125	MADIGAN AMC	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	14	13	13	13	13	
0131	WEED ACH	7	5	11	11	11	11	12	11	12	10	11	11	11	12	11	11	12	11	11	10	12	11	11	11	
0330	GUTHRIE AHC	9	11	10	11	10	10	11	11	10	9	10	10	11	11	10	11	10	10	11	12	12	11	10	10	9
0607	LANDSTUHL REGIONAL MEDCEN	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	13	11	13	13	13	13	12	
0612	121st GENERAL HOSPITAL	12	12	12	12	13	13	12	14	12	11	12	12	12	12	12	11	12	13	12	12	12	12	11	13	

US Navy Sites

Site ID	Medical Treatment Facility																									
0024	NH CAMP PENDLETON	12	13	13	13	13	12	13	13	13	13	13	13	13	13	13	12	13	13	13	13	13	13	13	13	
0028	NH LEMOORE	11	12	12	12	12	12	11	12	11	12	12	11	11	12	11	12	11	12	12	12	12	12	11	11	12
0029	NMC SAN DIEGO	13	10	12	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	12	13	13	13	13	
0035	NACC GROTON	11	11	11	10	11	11	11	10	10	9	11	12	11	11	10	10	10	10	9	9	10	10	9	9	10
0038	NH PENSACOLA	12	13	13	13	13	12	13	12	12	12	12	13	13	12	13	12	13	12	13	13	12	12	13		
0039	NH JACKSONVILLE	13	13	13	13	13	13	13	12	13	12	13	13	13	12	13	13	12	13	13	13	8	10	13		
0056	NH GREAT LAKES	13	13	12	12	12	12	12	12	12	12	12	12	12	12	12	13	12	13	12	13	14	12	13		
0067	NNMC BETHESDA	7	7	8	9	8	9	8	8	6	7	8	9	9	9	7	7	8	9	7	8	8	7	5	6	9
0091	NH CAMP LEJEUNE	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13		
0103	NH CHARLESTON	12	12	12	12	12	12	12	12	13	13	12	12	12	13	12	13	11	13	12	12	12	10	12	12	13

The HL7 Weekly Tracker – Sorted by Service: Is posted on the EIDS Web site and updated weekly. Uses data generated from the Data Tracker Database.

Operations Data Quality Tools

These tools and procedures allow EIDS to:

- **Catalogue data files**
- **Monitor data completeness**
- **Provide metrics to assess Data Quality/Completeness of data received**
- **Utilize DQ Software to provide event driven alerting and reporting**

"A thousand miles can lead so many ways…Just to know who is driving what a   help it would be…we found our driver."

Data Quality through Software

- Data Quality
- Context
- Data Ingest Scripts (DIS)
- Operations
- MDR

Data Quality

- Accuracy: is it free from error?
- Completeness: is it whole?
- Consistency: is it free from contradiction?
- Integrity: is it secure?
- Relatability: is it rationally correlated?
- Relevancy: is it appropriate?
- Timeliness: is it available when needed?
- Uniqueness: is it sole?
- Validity: is it sound?

Context
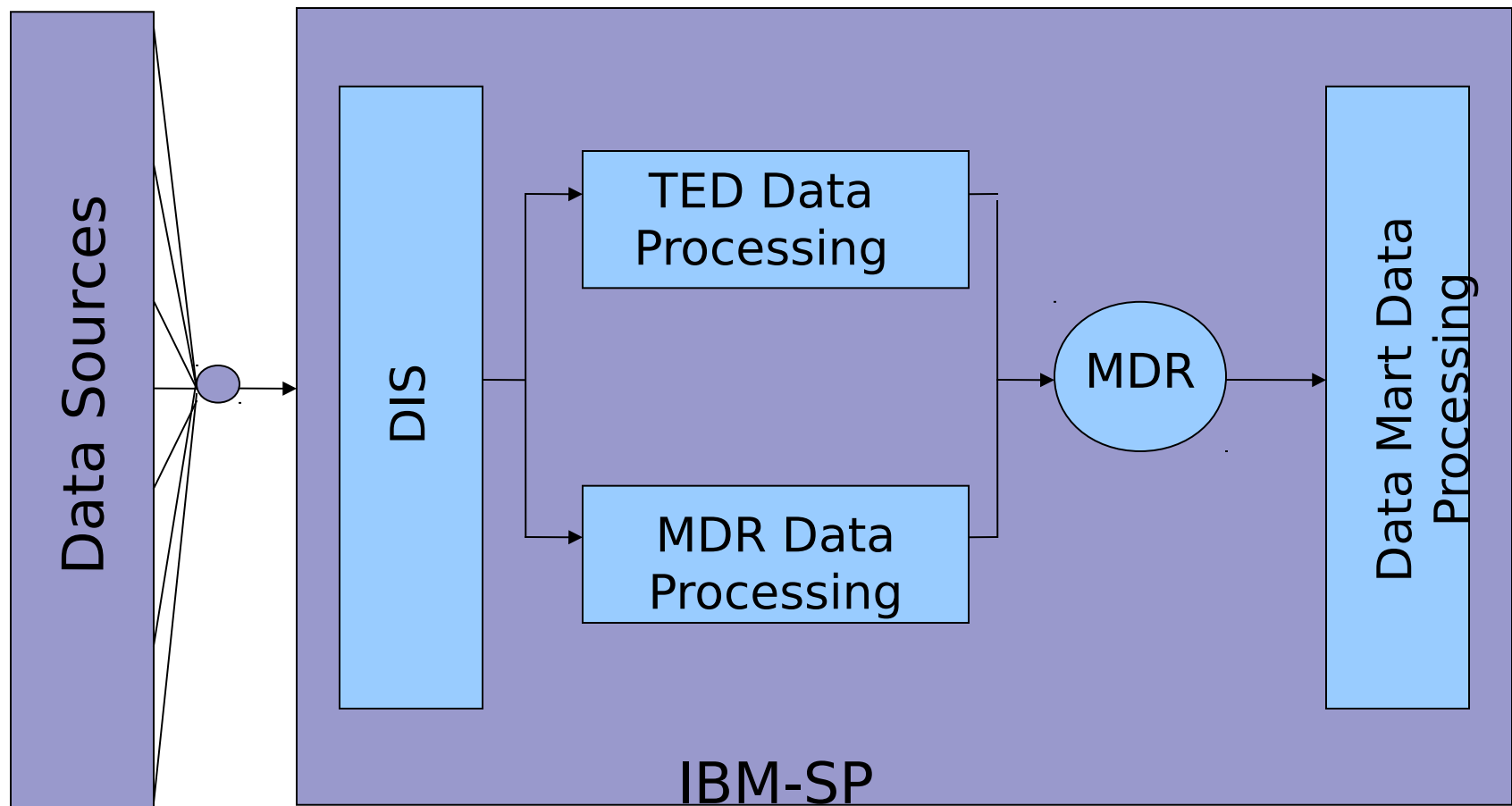
DIS

- Feed node scripts

- Preprocessors
    - Ancillary
    - Appointment
    - SADR
    - SIDR

Feed Node Scripts

- Decompress and decrypt
- Archive
- Correct location and ownership
- Copy for other real-time systems
- Inspect
  - File structure
  - Content of key fields
- Report

Preprocessors

- Reject bad records
  - Bad format
  - Invalid key fields
  - Currently no major edits
- Batch by week or month
  - Maintain record of contributing source files
  - Provide counts for reconciliation
- Transfer for MDR processing
  - Fully automated
  - Predefined schedule

DIS and Quality

	Accuracy	Completeness	Consistency	Integrity	Relatability	Relevancy	Timeliness	Uniqueness	Validity
Feed node scripts	X	X		X			X		
Preprocessors	X		X				X		X

Operations

- Data management
  - Data tracker
  - Ad hoc scripts
- Systems management
  - Query monitor
  - Systems monitoring

Data Tracker

- Store data on source files and records
- Identify unique records
- Track data by date
- Check data against source metadata
- Compare multiple data types
- Create x-bar control charts
- Provide daily reporting

Ad Hoc Scripts

- Identify source files sent in clear text
- Track corrections in source systems

Query Monitor

- Display query activity
- Identify performance issues
- Report access to PHI

System Monitoring

- Record and display system utilization
  - CPU and memory
  - IP connections
  - Tape drives
  - User activity

Operations and Quality

Data tracker		X			X	X	X	X	X
Ad hoc scripts	X			X					
Query monitor				X					
Monitoring support				X					

MDR

- Processors
- Processing utilities
- Access control script
- Metadata catalog

Processors

- Parse raw records
- Filter data
- Merge and de-duplicate with master data
- Derive standardized values
- Enhance with reference data
  - Enrollment
  - Facilities
  - Identity
  - Market areas
- Create feeds for data marts

Processing Utilities

- **Apply common functional logic**
- **Manage processor jobs**
  - Before execution
    - Calculate disk requirements
    - Check disk and tape resources
  - After execution
    - Document all inputs, references, and outputs
    - Check logs for errors and PHI
    - Extract counts and frequencies
    - Create metadata

Access Control Script

- Detect new files
- Examine and enforce file attributes
  - Ownership
  - Permissions
  - Access control lists

Metadata Catalog

- Store MDR metadata
- Track history of MDR files
- Audit MDR files
- Populate missing metadata
  - Size
  - Records
  - Format

MDR and Quality

	Accuracy	Completeness	Consistency	Integrity	Relatability	Relevancy	Timeliness	Uniqueness	Validity
Processors	X		X		X			X	
Processing utilities			X				X		X
Access control script				X					
Metadata catalog						X			X

Contact EIDS

- **Key to data quality success – partnering with our user community to maximize information sharing**
- **Call the Help Desk 1-800-600-9332**
- **Questions?**

Contact EIDS

Web Portal
- https://eids.ha.osd.mil
- account information
- product information

MHS Help Desk
phone: 800-600-9332
email: **eids@mhshelpdesk.com**